

[JP,2001-200118,A]

Japanese (PDF)

File Wrapper Information

FULL CONTENTS CLAIM + DETAILED DESCRIPTION
TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION
TECHNICAL PROBLEM MEANS EXAMPLE

[Translation done.]

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Notes:

1. Untranslatable words are replaced with asterisks (**).
2. Texts in the figures are not translated and shown as it is.

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Dictionary: Last updated 03/23/2009 / Priority: 1. Chemistry / 2. Mechanical engineering /

3. Technical term

FULL CONTENTS**[Claim(s)]**

[Claim 1](a) Thermoplastic elastomer which made polyolefin system resin distribute rubber which constructed the bridge selectively or thoroughly 10 to 70 weight %, (b) general formula A-B-A (here -- A -- a polymeric block of monovinyl substitution aromatic hydrocarbon.) which has the following characteristics B -- an elastomeric polymeric block of conjugated diene -- it is -- A hydrogenation derivative of a block copolymer written .. five to 40weight %, (**) MLMFR (softener [for 60 to 90 weight % (e) straight-mineral-oil system rubber] JIS K -7210 -- a table -- one -- conditions -- seven -- : -- temperature -- 190 -- ** -- load -- 211.68 -- N (21.60kgf) -- 0.1 -- g -- /-- ten -- a minute -- less than -- -- (**).) [polymeric block B in a block copolymer]As opposed to elastomer composition 100 weight section which blends 20 to 50 weight %, (f) Higher fatty acid amide ... 0.01 to 1 weight section, (g) polyorganosiloxane ... 0.5 - 10 weight section, (h) Acrylic silicone copolymer resin ... A thermoplastic elastomer composition adding at least one kind in (f) - (h) of 0.5 to 15 weight section.

[Claim 2]The thermoplastic elastomer composition according to claim 1 which blends 20 or less weight % of (c) ethylene-alpha olefin copolymer rubbers, and/or 15 or less weight % of (d) polypropylene regins with the

[Translation done.]

aforementioned constituent further.

[Claim 3]The thermoplastic elastomer composition according to claim 2 whose 1.5 - 10 dl/g and Shore A hardness limiting viscosity [eta] of ethylene-alpha olefin copolymer rubber of a component (c) is 90 or less.

[Claim 4](f) A thermoplastic elastomer composition given in any 1 paragraph of Claims 1-3 using higher fatty acid amide as an essential ingredient, using together (g) polyorganosiloxane or (h) acrylic silicone copolymer resin, and adding.

[Claim 5]A thermoplastic elastomer composition given in any 1 paragraph of Claims 1-4 whose viscosity of polyorganosiloxane of a component (g) is 10,000 or more centistokes.

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to thermoplastic elastomer, is rich in plasticity in more detail, and relates to the thermoplastic elastomer composition which has the embossing transcription nature which excelled and was excellent in the sex with a crack-proof [surface].

[0002]

[Description of the Prior Art]Although vulcanized rubber was in use to the rubber material of the industrial component fields, such as autoparts and household appliance parts, conventionally, since a weight saving and recycling-izing were easy, thermoplastic elastomer olefin came to be used widely. Although vinyl chloride resin had also been used widely, since the dioxin which is poisonous gas at the time of incineration was generated, thermoplastic elastomer olefin without a development of global-environment-problems top harmful gas came to be used widely. However, since conventional thermoplastic elastomer olefin is mainly using vulcanized rubber, there is a fault that it is inferior to embossing transcription nature in fabricating operations, such as extrusion and injection molding, and improvement of this point has been desired strongly.

[0003]

[Problem to be solved by the invention]An object of this invention is to provide the material which was made in order to solve said technical problem, was flexible, and was excellent in abrasion resistance, and was excellent in molding workability, such as extrusion and injection molding, especially the transcription nature of embossing at the time of injection molding.

[0004]

[Means for solving problem]As a result of inquiring wholeheartedly along with the above-mentioned purpose, this invention persons to the thermoplastic elastomer composition which consists of a hydrogenation derivative (it is also called = **** block copolymer.) of specific thermoplastic elastomer and a specific block copolymer, and a softener for straight-mineral-oil system rubber Higher fatty acid amide, It found

out that the constituent which adds still more specific ethylene-alpha olefin copolymer and/or polypropylene resin suited said purpose in at least one kind in polyorganosiloxane and acrylic silicone copolymer resin, and this invention was completed.

[0005] That is, this invention is [1]. (a) Thermoplastic elastomer which made polyolefin system resin distribute the rubber which constructed the bridge selectively or thoroughly 10 to 70 weight %, (b) general formula A-B-A (here -- A -- the polymeric block of monovinyl substitution aromatic hydrocarbon.) which has the following characteristics B -- the elastomeric polymeric block of conjugated diene -- it is -- The hydrogenation derivative of the block copolymer written .. five to 40 weight %, (**) MLMFR (softener [for 60 to 90 weight % (e) straight-mineral-oil system rubber] JIS K -7210 -- a table -- one -- conditions -- 17 -- : -- temperature -- 190 -- ** -- load -- 211.68 -- N (21.60kgf) -- 0.1 -- g -- /-- ten -- a minute -- less than -- (**).) [polymeric block B in a block copolymer] As opposed to elastomer composition 100 weight section which blends 20 to 50 weight %, (f) Higher fatty acid amide ... 0.01 to 1 weight section, (g) polyorganosiloxane ... 0.5 - 10 weight section, (h) Acrylic silicone copolymer resin ... Thermoplastic elastomer composition adding at least one kind in (f) - (h) of 0.5 to 15 weight section. [2] A thermoplastic elastomer composition given in the above [1] which blends 20 or less weight % of (c) ethylene-alpha olefin copolymer rubbers, and/or 15 or less weight % of (d) polypropylene resins with the aforementioned constituent further.

[3] A thermoplastic elastomer composition given in the above [2] whose 1.5 - 10 dl/g and Shore A hardness the limiting viscosity [eta] of the ethylene-alpha olefin copolymer rubber of a component (c) is 90 or less. [4] A thermoplastic elastomer composition given in any 1 paragraph of above-mentioned [1] - [3] using (f) higher fatty acid amide as an essential ingredient, using together (g) polyorganosiloxane or (h) acrylic silicone copolymer resin, and adding. And a thermoplastic elastomer composition given in either of above-mentioned [1] - [4] whose viscosity of the polyorganosiloxane of [5] components (g) is 10,000 or more centistokes. The above-mentioned purpose was attained by developing. [0006]

[Mode for carrying out the invention] The thermoplastic elastomer olefin containing the rubber composition over which the component (a) used by this invention constructed the bridge selectively or thoroughly can be conventionally manufactured by a publicly known method. It can obtain by specifically heat-treating dynamically the mixed material of olefin system resin and olefin system rubber under existence of organic peroxide. The method of constructing a bridge dynamically under existence of these organic peroxide is indicated to JP, S53-34210, B, JP, S53-149241, A, JP, H1-197544, A, etc., for example. As thermoplastic elastomer which distributed such rubber to polyolefin system resin, Ole FREX made from Japanese Polyolefine (trade name) etc. which are marketed can be used.

[0007] As polyolefin system resin used for a component (a) here, the

homopolymers or these copolymers of alpha olefin, such as ethylene, propylene, the butene- 1, or 4-methylpentene- 1, meet all together. Random or especially the block copolymer of propylene resin, for example, isotactic polypropylene, propylene, ethylene or propylene, and alpha olefins, such as the butene- 1 and the hexene- 1, is especially preferred. As olefin system rubber which is used for a component (a) and which constructed the bridge, ethylene-alpha olefin copolymer rubber or ethylene-alpha olefin non-conjugated diene copolymer rubber is mentioned.

[0008]1,000g/10 minutes or less of HLMFR(s) (it applies to the method of JIS K-7210 correspondingly and is a numerical value in the conditions of the temperature of 230 °C and the load 211.68N (21.60kgf)) of the thermoplastic elastomer as a component (a) are 700g/10 minutes or less preferably. Since mold goods are easily sticky while dynamic characteristics, such as breaking strength of a constituent, will decline remarkably, if HLMFR exceeds 1,000g/10 minutes, it is not desirable. As for the loadings of the component (a) to a thermoplastic elastomer composition, 10 to 70 weight % is preferred. When less than 10 weight %, a bridge formation rubber composition decreases and it is inferior to abrasion resistance. If it blends more mostly than 70 weight %, a bridge formation rubber composition will increase and molding workability, especially the embossing transcription nature at the time of injection molding will worsen.

[0009]The component (b) used by this invention is a hydrogenation derivative in which a general formula is obtained by carrying out hydrotreating of the block copolymer denoted by A-B-A, in the above-mentioned general formula, A is a polymeric block of monovinyl substitution aromatic hydrocarbon, and B is an elastomeric polymeric block of conjugated diene. Monovinyl substitution aromatic hydrocarbon of the monomer which constitutes polymeric block A is styrene preferably, and alpha-methylstyrene etc. are used. The conjugated diene monomer in polymeric block B may have butadiene or preferred isoprene, and both mixture may be sufficient as it.

[0010]0.1g/10 minutes or less of MLMFR(s) of the hydrogenation derivative of a block copolymer are 0.01g/10 minutes or less preferably. Since mold goods are easily sticky while dynamic characteristics, such as breaking strength of a thermoplastic elastomer composition, will decline remarkably, if MLMFR exceeds 0.1g/10 minutes, it is not desirable. The rate of occupying to the whole block copolymer needs to be 60 to 90 weight %, and, as for polymeric block B in these block copolymers, it is preferred that it is 65 to 87 weight %. When it becomes difficult to hold elastomeric after hydrogenation of the block copolymer was carried out, when polymeric block B was less than 60 weight % and exceeds 90 weight %, since it is inferior to mechanical strength, it is not desirable. In the hydrogenation derivative of these block copolymers, the thing of the conjugated double bond in polymeric block B to which hydrogenation of the not less than 80% was preferably carried out, and hydrogenation of the 25% or less of the aromaticity unsaturated bonds in polymeric block A was carried out not less than at least 50% is preferred. As a

hydrogenation derivative of such a block copolymer, KURARAY CO. LTD. SEPUTON (trade name) etc. which are marketed can be used.

[0011] 5 to 40 weight % is required for loadings of a component (b) to a thermoplastic elastomer composition. If less than 5 weight %, plasticity runs short, and if it blends more mostly than 40 weight %, stickiness will arise in mold goods. In order to excel in plasticity and to give heat-resisting properties, such as molding workability, especially embossing transcription nature at the time of injection molding, in this invention, It is preferred to blend 20 or less weight % of the component (c) ethylene-alpha olefin copolymer rubbers and/or 15 or less weight % of component (d) polypropylene resins.

[0012] Ethylene-alpha olefin copolymer rubber of a component (c) used by this invention is a copolymer which uses ethylene and alpha olefin as a component at least. As alpha olefin which copolymerizes with ethylene, at most 20 carbon numbers are 12 or less alpha olefins preferably, and propylene, the butene- 1, the hexene- 1, 4-methylpentene- 1, the octene- 1, etc. are mentioned as the example of representation. These one sorts or two sorts or more are copolymerized with ethylene. A copolymerization ratio of alpha olefin is usually 5-60-mol %.

[0013] It is possible to copolymerize a diene monomer further as ethylene-alpha olefin copolymer rubber in addition to such alpha olefins. As a diene monomer, a with a carbon numbers of four or more diene monomer. For example, butadiene, 1,4- and 1,5-hexadiene, 2,5-dimethyl-1,5-hexadiene and 1, a chain diene compound like 4-octadien, A thing using cyclic diene, for example, cyclohexadiene, cyclo-octadiene and dicyclopentadiene, ARUKE nil norbornene, for example, 5-ethylidene-, and 5-butylidene-2-norbornene etc. is mentioned. It is preferred to use ethylidene norbornene or dicyclopentadiene in these. A copolymerization ratio of a diene monomer is at most 10-mol %, and less than its 5 mol % is especially desirable.

[0014] 2g/10 minutes or less of MFR(s) [1g/10 minutes or less of] (the conditions 14 of the JIS K-7210 table 1: temperature of 230 **, load 21.18N) of this ethylene-alpha olefin copolymer rubber are 0.5g/a thing for 10 or less minutes especially preferably preferably. While dynamic characteristics, such as breaking strength etc. of the constituent which will be obtained if MFR exceeds 2g/10 minutes, get worse, it becomes easy to produce stickiness in mold goods. The loadings of a component (c) are 20 or less weight %, and its 5 to 20 weight % is preferred. By blending a component (c), it excels in plasticity and molding workability, especially the embossing transcription nature at the time of injection molding become good. When it blends more mostly than 20 weight %, the rubber composition over which a bridge is not constructed increases and the abrasion resistance as a thermoplastic elastomer composition worsens.

[0015] By using what has the following characteristics as this ethylene-alpha olefin copolymer rubber, the breaking strength of the elastomer composition by this invention and a heat-resisting property can be raised further. That is, the limiting viscosity [eta] in 135 ** decalin of this ethylene-alpha olefin copolymer rubber is 3 - 6 dl/g preferably 1.5 to 10

dl/g. In less than 1.5 dl/g, the hardness of an elastomer composition and the improvement effect of a compression set are small. Since flowability will fall and molding workability, such as surface dry rough skin at the time of extrusion and embossing inferior transfer at the time of injection molding, will worsen on the other hand if 10 dl/g is exceeded, it is not desirable.

[0016] In order to demonstrate good plasticity and rubber elasticity, the Shore A hardness of copolymer rubber is 75 or less especially preferably 80 or less preferably 90 or less. If the Shore A hardness exceeds 90, it will become a tendency which runs short of plasticity. A certain thing of the tensile breaking strength of this copolymer rubber is preferably preferred 9.80 or more MPa 6.86 or more MPa in the state of un-constructing a bridge. In less than 6.86 MPa, the hardness of an elastomer composition and heat-resistant improvement are small. In order to raise a heat-resisting property, it is necessary to measure with the differential scanning calorimeter (DSC) of this copolymer rubber, and to have a melting peak of a polyethylene nature crystal in not less than 100 **. The heat-resistant improvement effect of the thing without such a fusion component is small.

[0017] The example shown in JP,S57-179207,A as a suitable manufacturing method of the copolymer rubber which has these characteristics can be given. According to this method, the suitable copolymer rubber for this invention can be built by copolymerizing ethylene and alpha olefin in slurry form voice in saturation or unsaturated hydrocarbon with a carbon number of four or less under existence of a Ziegler type catalyst at the reaction temperature of 50 ** or less. By manufacturing by slurry form voice, this manufacturing method becomes possible [building easily the copolymer rubber containing high-melting PE crystal component unlike the conventional solution-polymerization method].

[0018] As a suitable catalyst for such a method, JP,S47-34478,A, 51-28189 and 52-151691 -- as [propose / or / No. 11909 / 56 to]. The catalyst system which contains the 3rd ingredient [an organoaluminium compound and if needed] like titanium, chlorine, and the solid component which contains magnesium if needed and aluminium trialkyl, Or JP,S56-151707,A, 57-141410, . As [propose / by 58-45209 or 59-215304] The catalyst system which serves as a solid component processed with the ring compound which contains oxygen or nitrogen for Ti, Mg, and the compound containing HAROGEN **, or this and an organoaluminium compound from the ring compound containing an organoaluminium compound, or this and oxygen at least is preferred. It is the catalyst system preferably proposed by JP,56-151707,A or 59-215304.

[0019] As a polypropylene regin of the component (d) used for this invention, a propylene homopolymer, a crystalline propylene-ethylene block copolymer, a crystalline propylene-ethylene random copolymer, a crystalline propylene-ethylene-butene random copolymer, etc. can be mentioned. [the measuring method of Tmp using main absorption peak temperature Tmp[DSC measuring method using DSC also in these] After

carrying out temperature up of 3-5 mg of the samples to 230 °C and dissolving using a DSC measurement device (made by PerkinElmer, Inc.). After cooling to 25 °C by a part for 10 °C/in temperature fall velocity and holding for 5 minutes at 25 °C, the main endothermic peak temperature (T_{mp}) is searched for from the endothermic peak curve obtained when temperature up is carried out to 230 °C by a part for heating-rate/of 10 °C. As for, it is desirable that it is not less than 120 °C, and it is preferred that there is not less than 145 °C more. It becomes easy to produce smeariness in the thermoplastic elastomer from which T_{mp} is obtained at less than 120 °C, and is inferior to a heat-resisting property. As for MFR of this propylene resin, the amount of 0.1-1000g/5 is desirable, and it is desirable that they are 0.5-100g/10 minutes more preferably. As for the loadings of a component (d), 15 or less weight % is preferred. It is more preferably chosen in 3 to 15 weight % of the range. When it blends more mostly than 15 weight %, it is inferior to plasticity.

[0020]The softener for straight-mineral-oil system rubber of a component (e) used by this invention is added in order to raise the flowability of a thermoplastic elastomer composition, and plasticity. The softener for straight-mineral-oil system rubber is the mixture with which three persons of an aromatic ring, a naphthene ring, and a paraffin chain combined, A paraffin chain carbon number calls paraffin series what has not less than 50% of the number of total carbon, not less than 30% of thing is called an aromatic system, and, as for that whose naphthene ring carbon number is 30 to 45%, the naphthene system and the number of aromatic carbon are distinguished. Although the softener for straight-mineral-oil system rubber in particular used as a component (e) in this invention is not limited, its thing of paraffin series and a naphthene system is preferred in respect of the dispersibility over a component (b). The thing of inside or paraffin series is preferred, and also the thing of 5% or less of an aromatic ring quantitative formula is the optimal also in paraffin series. The quantity of the straight-mineral-oil system softener blended with the constituent of this invention is 20 to 50 weight %.

When it is inferior to the flowability of a constituent, and plasticity and blends exceeding 50 weight %, since stickiness arises in mold goods, less than 20 weight % of combination is not preferred.

[0021]In order that the thermoplastic elastomer composition of this invention may improve the surface slippage of the above-mentioned elastomer composition [component+ (a) component (b) + component (c) + component (d) + component (e)], a sex with a surface crack, and abrasion resistance, Component (f) : higher fatty acid amide, component (g):polyorganosiloxane, and a component (h): By blending at least one ingredient in acrylic silicone copolymer resin, find out that this engine performance is improvable by leaps and bounds, and complete this invention. In this invention, although the component (f), component (g), and component (h) which are lubricant should just use at least one of them, it is still more effective to use together two sorts of a component (f), a component (g) or a component (f), and a component (h).

[0022]Although limitation in particular is not carried out as higher fatty acid amide of the component (f) used by this invention, As an example,

lauric acidamide, palmitic acidamide, octadecanamide, Saturated fatty acid amide, such as behenic acid amide, erucic acidamide, oleic amide, Screw fatty acid amide, such as unsaturated fatty acid amide, such as brein acid amide and elaidic acidamide, methylenescrew octadecanamide, methylenescrew oleic amide, ethylenescrew octadecanamide, and ethylenescrew oleic amide, etc. are used. The compound of the range of about 70 to 110 ** is especially preferred as a melting point. An addition is about 0.01 to 1 weight section to a total of 100 weight sections of an elastomer composition and a component [(a)+(b)+(c)+(d)+ (e)]. An addition becomes insufficient [the surface slippage of the product fabricated as they are 0.01 or less weight sections], gets damaged, and is inferior to a sex. When it adds exceeding one weight section, since stickiness arises in mold goods, it is not desirable.

[0023]As polyorganosiloxane of a component (g) used by this invention, although viscosity is a thing of 10,000 or more centistokes, the thing of 100,000 or more centistokes is preferred, and if it is 1 million or more centistokes, it is more desirable. Since the surface appearance of the thermoplastic elastomer from which viscosity is obtained by less than 10,000 centistokes gets worse with time progress, it is not desirable. It may use, after making gay polypropylene and a masterbatch if needed in combination. The loadings to an elastomer composition are about 0.5 to 10 weight section to a total of 100 weight sections of a component [(a)+(b)+(c)+(d)+ (e)]. An addition becomes insufficient [the surface slippage of the product fabricated as they are 0.5 or less weight sections], and is inferior to abrasion resistance. When it adds exceeding ten weight sections, since bleeding is carried out on the surface of mold goods and stickiness arises, it is not desirable. The polyorganosiloxane of this invention consists of JIORUGANO siloxane units intrinsically, and the ratio of an organic group/silicon atom is about 2. An organic group, for example A dimethylsiloxane unit, methylphenyl siloxane units, It is chosen out of methyl, the phenyl, vinyl, and allyl which exist as JIORUGANO siloxane units like diphenyl siloxane units, methylvinyl siloxane units, methylallyl siloxane units, and phenylvinyl siloxane units.

[0024]By blending with an elastomer composition, acrylic silicone copolymer resin of a component (h) used by this invention raises the slippage of the surface, and raises abrasion resistance. By copolymerizing an acrylate resin, especially, compatibility with polyolefin system resin etc. can be raised to silicone resin with especially slippage, and surface slippage can be kept continuous to it. Quantity of acrylic silicone copolymer resin blended with a constituent of this invention is 0.5 to 15 weight section. When slippage sufficient when there are few additions than 0.5 weight sections is not acquired, but abrasion resistance is inferior and it adds exceeding 15 weight sections, appearance is spoiled by bleeding of the surface of mold goods. Usually, when it uses in large quantities, stickiness produces lubricant for raising the surface slippage of an elastomer composition. However, although the Reason is not certain by using together in the above combination, it is obtained, without producing stickiness, advanced slippage, i.e., abrasion resistance. It is suitable in especially environment exposed to an elevated

temperature. Therefore, it becomes parts with severer specs, for example, an assist grip for vehicles with a frequent contact opportunity, a shift lever, an armrest, etc. usable.

[0025]To the thermoplastic elastomer composition of this invention, an antioxidant, weathering material, a nucleating agent, a colorant, various fillers, etc. may be added if needed. As a method of manufacturing the thermoplastic elastomer composition of this invention, all the general methods used for manufacture of the usual resin composition and a rubber composition are employable. It is the mechanical melt kneading method fundamentally, and a single screw extruder, a twin screw extruder, a Banbury mixer, various kneaders, Brabender, a roll, etc. are used for these. The thermoplastic elastomer composition of this invention can be fabricated using the thermoplastics making machine generally used, and can apply various kinds of forming processes, such as injection molding, calender molding, and blow molding.

[0026]

[Working example]Hereafter, this invention is not limited by these although a work example explains this invention concretely.

(Measuring method)

[HLMFR] According to the method of JIS K-7210, it measured on condition of the temperature of 230 **, and the load 211.68N.

[MLMFR] It measured on condition of [17] JIS K-7210 and Table 1.

[MFR] It measured on condition of [14] JIS K-7210 and Table 1.

[Shore A hardness] It measured according to ASTM D2240.

[Tension test] According to JIS K6301, breaking strength and elongation after fracture were measured on condition of for speed-of-testing/of 200 mm using the No. 3 dumbbell.

[0027][Sex examination with a crack-proof [surface]] The plate (the size of 140x140 mm and 2 mm in thickness) was created with injection molding. [the Gakushin-type abrader by HEIDON (HEIDON-14DR)] The cotton for the Japanese Standards Association JIS fastness-of-color examination (calico 3 item) was set to the wear jig, the wear jig was put on this monotonous surface, and it measured 1 time respectively by 100 mm of migration length, and 200 round trips by normal-load [of 400 g], and movement speed/of 1,700 mm. The measurement portion was observed visually, the case where x and either were also slightly observed in the case where decoloring to the marks and the cloth of wear is observed clearly was estimated as **, and the case where neither was observed at all was estimated as O.

[0028][Embossing transcription nature] The plate was created with injection molding and visual observation estimated.

O : -- the whole surface -- a clear crimp -- creation.

x: There is an ambiguous crimp in part.

[Tactile feeling] The plate was created with injection molding, the hand described directly, and it judged as follows.

O : there is no feeling of stickiness and a good feel is shown.

** : A feeling of stickiness is sensed a little.

x: A feeling of stickiness is sensed considerably.

[0029][Raw material] Various kinds of thermoplastic elastomer

compositions were prepared using following each raw material.
 O Component (a): -- thermoplastic elastomer olefin -- as the thermoplastic elastomer olefin containing the rubber composition which constructed the bridge selectively or thoroughly -- TPE-1 (made in [Japanese Polyolefine] HLMFR:330g/10 minutes, and Shore A:86 -- "me -- flex time E410G")

O Component (b) : the hydrogenation derivative of the block copolymer which the hydrogenation derivation object used as for the block copolymer is shown in Table 1.

[0030]

[Table 1]

No.		MLMFR (g/10分)
SEP-1	スチレンの重合体ブロックと、イソブレンとブタジエンのランダム共重合体ブロックとのブロック共重合体水素添加誘導体 (スチレン含有量 : 30重量%)	0.01未満 (流動せず)
SEP-2	スチレンの重合体ブロックと、イソブレン重合体ブロックのブロック共重合体水素添加誘導体 (スチレン含有量 : 13重量%)	1

[0031]Component (c) : O, [as ethylene-alpha olefin copolymer rubber ethylene-alpha olefin copolymer rubber] Ethylene propylene copolymer rubber [EP-1 (MFR: 0.02g/10-minute, [eta] =5.4 dl/g, and Shore A hardness =73, made in Montel S DK Sunrise "ST053T")

O Component (d) : it is PP-1 (ethylene content: 0.5 or less weight %, MFR:30g/10 minutes, Tmp=163 **, made in Montel S DK Sunrise "PX900N") as polypropylene polypropylene.

O Component (e) : the straight-mineral-oil system rubber softener straight-mineral-oil system rubber softener used paraffin series oil (pour point: -15 **, and kinematic viscosity @98 **:38.1 centistokes, flash point:300 **, and "PW-380" by Idemitsu Kosan).

O Component (f) : the **** higher fatty acid amide for higher fatty acid amide is oleic amide.

[0032]O Component (g) : the **** polyorganosiloxane for polyorganosiloxanes is as follows.

<Si-1> straight silicone oil (polydimethylsiloxane) ("silicone oil BY16-140" by Toray Industries Dow Corning) viscosity; 1 million centistokes, degree-of-plasticity;1.5-2.0, the specific gravity 0.98 (25 **), the refractive index 1.404 (25 **)

<Si-2> straight silicone oil (polydimethylsiloxane) ("silicone oil SH200-100,000" by Toray Industries Dow Corning) viscosity; 100,000 centistokes, the specific gravity 0.98 (25 **), the refractive index 1.404 (25 **)

<Si-3> straight silicone oil (polydimethylsiloxane) ("silicone oil SH200-

10,000" by Toray Industries Dow Corning) viscosity; 10,000 centistokes, the specific gravity 0.98 (25 **), the refractive index 1.404 (25 **)
O Component (h) : acrylic silicone copolymer resin acrylic silicone copolymer resin used <SA-1> SHARINU R-170 (made by Nissin Chemical Industry).

[0033](Work examples 1-13) The thermoplastic elastomer which made polyolefin system resin distribute rubber, The hydrogenation derivative of a block copolymer, ethylene-alpha olefin copolymer rubber, A polypropylene resin and a straight-mineral-oil system rubber softener to the blended elastomer composition at a rate shown in Table 2 and 3
Higher fatty acid amide, Polyorganosiloxane and acrylic silicone copolymer resin were blended at a rate shown in the above-mentioned table, melt kneading of this constituent was carried out using said direction twin screw extruder KTX-37 (made by Kobe Steel, Ltd.), and the pellet was obtained. The sample was created for the obtained pellet with injection molding, and the aforementioned various physical properties were evaluated. The result was shown in Tables 2 and 3. A glove rail is actually fabricated, the long-term engine performance etc. which are carried in crimp transcription nature, tactile feeling, and a car other than a heat-resisting property are evaluated, and all have obtained the good result.

[0034]

[Table 2]

	単位	実施例1	実施例2	実施例3	実施例4	実施例5	実施例6	実施例7
(a) TPE-1	重量%	33	30	35	33	33	33	33
(b) SEP-1	重量%	17	15	18	17	17	17	17
(b) SEP-2	重量%							
(c) EP-1	重量%	15	20	8	15	15	15	15
(d) PP-1	重量%	5	5	10	5	5	5	5
(e) PW380	重量%	30	30	29	30	30	30	30
(f) 4-2 酸アミド	重量部	0.2	0.2	0.2				
(g) Si-1	重量部				0.5	5		
(g) Si-2	重量部						5	
(g) Si-3	重量部							5
(h) SA-1	重量部							
HLMFR	g/10分	400	360	680	460	620	620	610
997A硬度		63	63	72	63	63	63	63
傷付き性		○	○	○	△	○	○	○
シボ転写性		○	○	○	○	○	○	○
触感		○	○	○	○	○	○	△

[0035]

[Table 3]

	単位	実施例8	実施例9	実施例10	実施例11	実施例12	実施例13
(a) TPE-1	重量%	3.3	3.3	3.3	2.5	3.8	4.5
(b) SEP-1	重量%		1.7	1.7	3.0	2.2	1.5
(b) SEP-2	重量%	1.7					
(c) EP-1	重量%	1.5	1.5	1.5	1.0		
(d) PP-1	重量%	5	5	5		5	
(e) PW380	重量%	3.0	3.0	3.0	3.5	3.5	4.0
(f) 4-ヒドロキシ安息香酸	重量部	0.1		0.1	0.2		
(g) Si-1	重量部	3					3
(g) Si-2	重量部						
(g) Si-3	重量部						
(h) SA-1	重量部		5	3		1.0	
HLMPR	g/10分	600	600	570	410	550	700
Shore A硬度		63	63	63	50	63	60
傷付き性		○	○	○	△	○	○
シボ転写性		○	○	○	○	△	○
触感		○	○	○	○	○	○

[0036](Comparative examples 1-7) For comparison, the sample was created with the material and loadings which are shown in Table 4, and various physical properties were evaluated like the work example. An evaluation result is combined with Table 4 and shown.

[0037]

[Table 4]

	単位	比較例1	比較例2	比較例3	比較例4	比較例5	比較例6	比較例7
(a) TPE-1	重量%	33	33	30	33	33	33	33
(b) SEP-1	重量%	17	17	15	17	17	17	17
(b) SEP-2	重量%							
(c) EP-1	重量%	15		25	15	15	15	15
(d) PP-1	重量%	5	20	5	5	5	5	5
(e) PW300	重量%	30	30	25	30	30	30	30
(f) 4-(7-酸73)	重量部		0.5	0.2	3			
(g) Si-1	重量部					15		
(g) Si-2	重量部						15	
(g) Si-3	重量部							15
(h) SA-1	重量部							
MLMPR	g/10分	400	760	630	400	810	790	600
引張強さ	MPa	4.6	9.2	5.2	4.6	4.3	4.4	4.7
引張伸び	%	350	560	510	350	360	370	360
硬度		63	80	70	63	63	63	63
優付き性		×	△	△	○	○	○	○
揮発性		○	×	○	○	○	○	○
耐熱性		○	○	×	×	×	×	×

[0038] If it is a glove rail using the thermoplastic elastomer composition of this invention so that clearly from Tables 2 and 3, It has the outstanding rubber property and sex with a crack-proof, and excels in embossing transcription nature, such as extrusion and injection molding, and also moreover, there is also no bleeding of paraffin series oil (softener for straight-mineral-oil system rubber).

[0039]

[Effect of the Invention] The thermoplastic elastomer composition of this invention is rich in plasticity, and has the embossing transcription nature which excelled and was excellent in the sex with a crack-proof [surface]. It is lightweight, and recycling is easy, and it is an energy saving and saving-resources type elastomer, and is good also from an environmental aspect.

[Translation done.]

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